Finding of No Significant Impact
for the
Replacement Source of Steam for A Area
at the
Savannah River Site

Agency: U.S. Department of Energy

Action: Finding of No Significant Impact

Summary: The Department of Energy (DOE) has prepared an environmental assessment (EA) (DOE/EA-1568) to analyze the potential environmental impacts of the proposed construction and operation of a replacement steam plant in A Area at the Savannah River Site (SRS). The draft EA was made available to the States of South Carolina and Georgia, and to the public, for a 30-day comment period. Based on the analyses in the EA, DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an environmental impact statement (EIS) is not required and DOE is issuing this finding of no significant impact (FONSI).

Public Availability: Copies of the EA and FONSI or further information on the DOE NEPA process are available from:

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Background: The existing steam plant in A Area is comprised of two coal-fired boilers located in Building 784-A, producing 325 pounds per square inch gauge saturated steam at a minimum of 15,000 pounds per hour (lb/hr). The two 60,000 lb/hr capacity coal fired boilers were installed in 1953. Steam is used in A Area primarily for process loads, space heating, domestic hot water, and heating, ventilation, and air conditioning (HVAC) humidification needs. Multi-cone dust collectors are used as air pollution control devices to collect particulate matter. Savannah River National Laboratory (SRNL) and the Savannah River Ecology Laboratory (SREL) use steam primarily for HVAC and intermittently for process needs.

The existing steam plant was sized to supply a much higher volume of steam demand. Current and projected demands for steam are lower than historical levels as a result of facility deactivation and decommissioning that has taken place in A Area. Steam is vented during most months to maintain boiler operation as the current system is greatly oversized for current steam needs. The pollution control systems on the existing steam

plant will not be adequate to meet new air emission limits which go into effect in 2007. Capital investment to upgrade the existing facility will be necessary to meet the new limits if a replacement steam plant is not built.

Purpose and Need for Agency Action: On September 13, 2007, new emission standards promulgated under 40 CFR Part 63, Subpart DDDDD "National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Industrial Boilers and Process Heaters", will go into effect for existing boilers. The A Area steam plant does not currently meet the new Maximum Achievable Control Technology (MACT) air permit restrictions. The purpose of the proposed and alternative actions is to ensure that A-Area steam needs are satisfied in a timely, technically reliable, and cost-effective manner while compliance with the new air emissions standards is achieved and maintained.

Proposed Action: The proposed action is to replace the existing over-capacity steam production system with a new system having controls capable of meeting the new emission standards and appropriately sized to meet current and projected A-Area steam demands. The existing steam plant would cease to operate once the replacement boilers are operational. Dismantlement and removal of Building 784-A will be a separate NEPA action and therefore is not considered in the EA.

DOE proposes to replace the existing coal-fired A-Area boilers with a smaller, less polluting, wood-fired boiler and a backup oil-fired boiler. If DOE decides to replace the existing steam plant, start of construction and completion of the proposed facility are planned for February 2007 and July 2008, respectively. Due to the length of time required for contracting, funding, design, permitting, construction, and startup the new facility will not be in operation by the September 13, 2007, effective date for the new emission standards, and DOE would have to shut down the existing facility. SRS requested, in accordance with South Carolina Department of Health and Environmental Control (SCDHEC) recommendation, a one-year extension to the compliance date for the new emission standard for the existing A-Area steam boilers, as allowed in 40 CFR 63.6 (i), to provide time for installation of the replacement system. SCDHEC has conditionally approved this one-year compliance date extension. The new steam facility will be compliant with the 40 CFR Part 63, Subpart DDDDD standards upon startup. The existing steam facility will be shut down upon startup of the new facility.

The scope of the new A-Area Steam Plant was developed by an Energy Services Company (ESCO) under the requirements of the Federal Energy Management Program, which is managed by DOE. Under this Program, ESCOs must guarantee and annually validate energy and maintenance cost savings that result from the more efficient operations of their projects compared to the costs for the facilities and equipment they replace. For this project the ESCO evaluated the use of natural gas, coal, and fuel oil as the primary fuel source for the new A-Area steam plant. These alternative fuel sources were not selected for the following reasons:

- Natural Gas – No satisfactory supply exists within 20 miles of the Site.

- Fuel Oil –Executive Order 13123, (Greening the Government Through Efficient Energy Management) recommends against the use of petroleum products for new energy sources and the price of fuel oil is highly volatile, making savings estimation highly problematic for large fuel oil expenditures.

- Coal – use of coal would require significant Clean Air Act controls and the equipment for Clean Coal technology is 50 percent of the cost of a new boiler, making it prohibitively expensive for such a small boiler.

The new steam production facility will be sized to meet A-Area steam loads and SRNL process needs. Steam production will meet an average demand of 15,000 lb/hr and a peak demand of approximately 35,000 lb/hr. The steam source will be capable of combusting both solid fuels and fuel oil. Biomass fuels (i.e., wood) will be used the majority of the time, with fuel oil serving as a backup energy source during maintenance outages or peak demands. The most economical fuel that is readily available and allowable by the SCDHEC regulations is woody biomass.

A large quantity of low value woody biomass (tree tops, small diameter trees, branches, limbs, etc.) is generated as a byproduct of forest management practices. During tree harvesting this material is generally left at the logging site before the logs are hauled for processing. The material left at the logging site will either decay or be consumed in a controlled burn prior to tree plantings. SRS would utilize a contract with a fuel supplier/vendor for the woody biomass. Harvesting this currently underutilized byproduct of timber production offers a tremendous opportunity for energy systems to use this resource. However, logging residues, when left to decay, can contribute nutrients to the site and habitat for various organisms. Removal of logging residues for use as biomass fuel would reduce this nutrient input and alter the habitat. The primary source of wood fuel for the A-Area Powerhouse will be obtained from SRS and offsite timber and wood waste left over from logging operations. No additional harvesting is planned on SRS; however, the possibility of planting and utilizing short rotation woody crops may be evaluated as a sustainable source of fuel through establishing and monitoring of experimental and demonstration sites.

The facility will be equipped with pollution control and monitoring equipment required to meet current and anticipated environmental requirements. The design of the new facility will minimize operating and maintenance costs.

A steel framed industrial structure will be constructed on a concrete pad to house the steam generators and all piping necessary to interface with existing site utilities. The existing A-Area well water system will supply process water for the steam system. The steam supply will be connected to the existing steam system at the nearest convenient overhead location. Domestic water will be supplied from the existing domestic water system. Boiler blowdown will be routed to the existing sanitary sewer system. Generated ash will be disposed of in an appropriate approved solid waste management facility. The balance of the plant, which will include all associated fuel handling, storage equipment, and a three- to five-day biomass supply, will be contained inside a protective

structure located on the site of the coal storage area adjacent to the existing A-Area steam plant.

The primary location being considered for the proposed facility is an area adjacent to the site of the existing steam generation plant. An alternative location for the proposed facility is an existing asphalt parking lot located near SRNL.

Alternative Actions: In accordance with NEPA regulations, DOE examined the following alternatives to the proposed action:

No Action Alternative

The no action alternative consists of DOE continuing to operate the existing A-Area steam plant with no changes in air emissions control technology. If the 'no action' alternative is implemented, DOE will not be in compliance with the requirements of the new MACT air quality permit requirements.

Alternative Action

The pollution control systems on the existing steam plant (Building 784-A) are not adequate to meet new air emission limits which go into effect in 2007. An alternative action will be to upgrade the existing coal-fired boilers with new emission control technology and continuous opacity monitoring to meet new regulatory requirements. Although these upgrades will provide for regulatory compliance, the cost of a new pollution control system for the existing boilers will be approximately $3 million and the upgraded plant will still be oversized and too large to efficiently and cost effectively provide steam to A Area.

Environmental Impacts: The proposed primary and alternative steam plant locations are both located in previously developed, industrialized landscapes on SRS. The first is in the existing footprint of the coal pile adjacent to the 784-A Powerhouse. The other site is in a large parking lot near SRNL. Based on the previous uses of the project areas, the potential for the proposed action to significantly impact environmental as well as archaeological or cultural resources at SRS will be negligible. At both sites, the construction technique will be the same with the removal of the overburden (including coal or asphalt) and digging foundations for the new powerhouse building. Floor drains and other underground utilities will be installed prior to pouring a concrete base slab on grade and erecting a steel structure that will house the new boilers. Additional acreage will be cleared to provide a storage area for both the wood chips and an oil storage facility to house the fuel for both boilers. No undisturbed areas will be used to construct the facilities. The excavation for the facilities and utilities most probably should not exceed five feet from the existing elevations. The associated construction-related activities will be relatively short-lived, cause minimal disruption to facility and area operations, and be conducted using best management practices. No known waste sites or contaminated soils will be disturbed. Any leaks or spills occurring during project installation will be contained and cleaned up in accordance with SRS procedures and protocols. The potential for these construction-related activities to adversely impact the human environment (e.g., air, land, water, biotic resources) will be negligible. DOE does

not expect any significant water quality stormwater runoff issues from either of the proposed plant construction sites. The potential impacts associated with the disposition of waste streams generated by implementation of the proposed action will be negligible and bounded by previous NEPA review.

Construction of a wood-fired boiler with a fuel oil fired backup boiler equipped with air emission control technology capable of meeting the new air permit requirements will significantly benefit regional air quality because of reduced emissions of carbon dioxide (a greenhouse gas) and particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$). The combustion of wood is much less polluting in terms of sulfur dioxide a known precursor to secondary $PM_{2.5}$ formation and acid rain. Pollutants calculated to increase compared to current operations are carbon monoxide (53.653 tons/year), and volatile organic carbon (2.411 tons/yr). Many pollutants, such as sulfur dioxide (-244.198 tons/yr), total particulates (-69.700 tons/yr), and particulate matter with a diameter of 10 microns or less (-32.063 tons/yr), were calculated to decrease after ceasing operation of the current boilers and starting operation of the new wood- and oil-fired boilers. The calculated increase in CO release, while double the amount currently produced, is still below Prevention of Significant Deterioration limits thresholds of 100 tons per year. The significant reduction of SO_2 and particulate matter greatly overshadows the increase in CO. Air emissions associated with construction activities (e.g., trucks, backhoes, bulldozers, equipment emissions, and fugitive dust) will be temporary, their impacts minimal, and not require permitting. Air emissions from operation of the proposed replacement steam plant and of equipment operation (e.g., trucks, front-end loaders, etc.) will be in compliance with applicable air quality regulations and will not significantly impact the human environment.

Implementation of the proposed action will be supported by existing SRS infrastructure and resources (e.g., waste management, power, potable water, roads, etc.). Any additional waste loads and resource utilization generated by the proposed action will easily be accommodated by existing SRS facilities and the associated environmental impacts will be negligible. DOE does not expect any increase in SRS or offsite traffic accidents and associated injury rates as a result of construction or operation activities.

Workforce requirements and costs associated with implementation of the proposed action will be minimal compared to the total SRS budget and employment. Consequently, the potential for significant socioeconomic impacts within the SRS region-of-influence will be negligible. Any environmental impacts associated with the proposed action will be limited to specific geographic areas within SRS and not be evidenced beyond the site boundary. The potential for engendering environmental justice issues will therefore be negligible.

Impacts to worker health and safety will be negligible due to the use of appropriate safety practices, personal protective clothing and equipment, and enforcement of Occupational Safety and Health Administration compliant work conditions. The potential for impacting human health and safety (both on and offsite) will be minimal.

Implementation of the proposed action is not expected to have a measurable impact on the human environment (e.g., socioeconomics, human health and safety, threatened and endangered species, wetlands, floodplains, migratory avian species, air, land, and water resources).

The proposed action will not add measurably to the cumulative environmental effect of other ongoing actions and operations within SRS and the surrounding area. The application of air pollution control technology and the use of wood fuel will minimize the potential for air emissions resulting from project implementation to interact with other SRS pollutant sources or have a cumulative impact on criteria air pollutants. The calculated increase in carbon monoxide release, while double the amount currently produced, is still below Prevention of Significant Deterioration limits thresholds of 100 tons per year. The significant reduction of sulfur dioxide and particulate matter greatly overshadows the increase in carbon monoxide. Additionally, the disposition of waste streams generated by facility construction and operation will easily be accommodated by onsite wastewater treatment and landfill capacity. Harvesting and utilizing a renewable resource (woody biomass) will have less impact on the environment and is preferred to the burning of non-renewable resources (fossil fuels). The potential for the incremental impacts of the proposed action to contribute to a cumulative effect is further minimized by the constantly improving quality of the SRS environment resulting from ongoing cleanup and restoration efforts. Vehicular traffic in the A Area has decreased as operations and facilities are being decommissioned and demolished. Any particulate air emissions from increased truck traffic will be offset by the reduced emissions from the combustion of woody biomass fuel.

Determination. Based upon the information and analyses in the EA (DOE/EA-1568), DOE has determined that the proposed construction and operation of a replacement steam plant in A Area at SRS does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS is not required and DOE is issuing this FONSI.

Signed in Aiken, South Carolina, this 6th day of October 2006.

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